

CLAIMS

1. An image decoding apparatus comprising:
 - an analyzing section which determines a process quantity of a coded image data to each of a plurality of image decoding processes within a unit process time based on a parameter for said coded image data, prior to said plurality of image decoding processes; and
 - an image decoding section which carries out each of said plurality of image decoding processes to said coded image data for the determined process quantity such that a decoded image data is generated from said coded image data.
- 15 2. The image decoding apparatus according to claim 1, wherein said parameter is an internal parameter of said coded image data.
- 20 3. The image decoding apparatus according to claim 1, wherein said parameter is an external parameter for said coded image data.
- 25 4. The image decoding apparatus according to claim 1, wherein said parameter contains an internal parameter of said coded image data, and an external parameter for said coded image data.

5. The image decoding apparatus according to any of claims 1 to 4, wherein said coded image data comprises a plurality of code blocks, and

said analyzing section determines said

5 process quantity to each of said plurality of image decoding processes by determining a code block process quantity for each of said plurality of code blocks based on said unit process time.

10 6. The image decoding apparatus according to any of claims 1 to 5, wherein said coded image data is a part of a coded image data stream,

a stream process time of said coded image data stream is previously determined, and

15 said unit process time is determined based on a number of said coded image data in said coded image data stream and said stream process time.

7. The image decoding apparatus according to
20 claim 6, wherein said plurality of decoding processes contains an arithmetic decoding process, a bit modeling decoding process, an inverse quantization process and an inverse wavelet conversion process, and
said image decoding section carries out a set
25 of said arithmetic decoding process and said bit modeling decoding process, said inverse quantization process, and said inverse wavelet conversion process

in a pipeline.

8. The image decoding apparatus according to
claim 7, wherein said image decoding section
5 comprises:

an arithmetic decoding section which carries
out said arithmetic decoding process to said coded
image data for the determined process quantity;

10 10 out said bit modeling decoding section which carries
said arithmetic decoding process by said arithmetic
decoding section in a form of bit planes every color
component for the determined process quantity;

15 15 out said inverse quantization section which carries
said bit modeling decoding process to a result of
said bit modeling decoding section for the determined process
quantity; and

20 20 an inverse wavelet conversion process section
which carries out said inverse wavelet conversion
process to a result of said inverse quantization
process by said inverse quantization section for the
determined process quantity.

25 9. The image decoding apparatus according to any
of claims 1 to 4, wherein said coded image data is
encoded into a plurality of layers,

said analyzing section determines a number of layers to be decoded based on said process quantity of said coded image data in said inverse quantization process and said process quantity of said coded image 5 data in said inverse wavelet conversion process, and

 said image decoding section carries out each of said plurality of decoding processes to said coded image data for the determined number of layers to be decoded.

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10. The image decoding apparatus according to claim 9, wherein said analyzing section discards a part of said coded image data other than a part of said coded image data associating with the determined 15 number of layers to be decoded.

11. The image decoding apparatus according to claim 9 or 10, wherein said plurality of decoding processes contain an arithmetic decoding process, a 20 bit modeling decoding process, an inverse quantization process and an inverse wavelet conversion process, each of said plurality of layers of said coded image data contains a plurality of code blocks, said parameter contains a weight coefficient 25 allocated to each of said plurality of code blocks, said analyzing section determines a number of coding paths in said arithmetic decoding process and

said bit modeling decoding process to each of said plurality of code blocks from said weight coefficients and said unit process time, and determines a number of bit planes from the determined coding paths, and

5 said image decoding section carries out said inverse quantization process and said inverse wavelet conversion process to said coded image data for the determined number of bit planes.

10 12. An image decoding method of decoding a decoded image data from a coded image data through a plurality of decoding processes, comprising:

 determining a process quantity of said coded image data in each of said plurality of image decoding processes within a unit process time based on a parameter for said coded image data; and

 carrying out said plurality of image decoding processes to said coded image data for the determined process quantities.

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13. The image decoding method according to claim 12, wherein said parameter is an internal parameter of said coded image data.

25 14. The image decoding method according to claim 12, wherein said parameter is an external parameter for said coded image data.

15. The image decoding method according to claim
12, wherein said parameter contains an internal
parameter of said coded image data, and an external
parameter for said coded image data.

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16. The image decoding method according to any of
claims 12 to 15, wherein said coded image data
contains a plurality of code blocks,

10 comprises:

determining said process quantity by
determining a code block process quantity allocated to
each of said plurality of code blocks based on said
unit process time.

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17. The image decoding method according to any of
claims 12 to 16, wherein said coded image data is a
part of a coded image data stream,

20 a stream process time of said coded image
data stream is predetermined, and

said image decoding method further comprises:

determining said unit process time based on a
number of said coded image data in said coded image
data stream and said stream process time.

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18. The image decoding method according to claim
17, wherein said plurality of decoding processes

contain an arithmetic decoding process, a bit modeling decoding process, an inverse quantization process and an inverse wavelet conversion process,

5 said carrying out said plurality of image decoding processes comprises:

carrying out a set of said arithmetic decoding process and said bit modeling decoding process, said inverse quantization process, and said inverse wavelet conversion process in a pipeline.

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19. The image decoding method according to any of claims 12 to 15, wherein said carrying out said plurality of image decoding processes comprises:

carrying out said arithmetic decoding process
15 to said coded image data for the determined process quantity;

carrying out said bit modeling decoding process to a result of said arithmetic decoding process for the determined process quantity;

20 carrying out said inverse quantization process to a result of said bit modeling decoding process for the determined process quantity; and

carrying out said inverse wavelet conversion process to a result of said inverse quantization process for the determined process quantity.

25 20. The image decoding method according to any of

claims 12 to 15, wherein said coded image data is encoded in a plurality of layers,

said determining a process quantity comprises:

5 determining a number of layers to be decoded based on said process quantities of said coded image data in said inverse quantization process and said process quantity of said coded image data in said inverse wavelet conversion process, and

10 said carrying out said plurality of image decoding processes comprises:

carrying out each of said plurality of decoding processes to said coded image data for the determined number of layers to be decoded.

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21. The image decoding method according to claim 20, further comprising:

discarding a part of said coded image data other than a part of said coded image data
20 corresponding to the determined number of layers to be decoded.

22. The image decoding method according to claim 20 or 21, wherein said plurality of decoding processes
25 contain an arithmetic decoding process, a bit modeling decoding process, an inverse quantization process and an inverse wavelet conversion process,

each of said plurality of layers of said coded image data contains a plurality of code blocks,

said parameter contains a weight coefficient allocated to each of said plurality of code blocks,

5 said determining a process quantity

comprises:

determining a number of coding paths in said arithmetic decoding process and said bit modeling decoding process to each of said plurality of code 10 blocks from said weight coefficients and said unit process time; and

determining a number of bit planes from the determined coding paths, and

15 said carrying out said plurality of image decoding processes comprises:

carrying out said inverse quantization process and said inverse wavelet conversion process to said coded image data for the determined number of bit planes.

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23. A computer-readable recording medium on which a software is recorded to realize said image decoding method according to any of claims 12 to 22.